Message

From: Alexander, Shanna [Alexander.Shanna@epa.gov]
Sent: 9/27/2021 10:22:08 PM
To: Amoroso, Cathy [Amoroso.Cathy@epa.gov]; Adams, Glenn [Adams.Glenn@epa.gov]
Subject: RE: request for your help
Attachments: Oak Ridge Fish Comparison Criteria Table 27SEP2021rev.xlsx

Cathy,

Somehow I missed this email. Sorry, but I wish I had gotten to it before replying to Glenn earlier. Your email was buried in Monday's emails. This is most likely the origin of the AWQC equivalents for the 4 example rads. I am in favor of applying the AWQC equivalents using the OW equation and parameter values from your attachment since I see now that OW's approach uses 365 days/year (not CERCLA's 350 days/year). However, a separate issue is that the numbers I calculated using OW's equation (with EF=365 days/year) does not match the values shown in their own table. For example, I calculated 297 and 64 pCi/L for Tc-99 and Sr-90, respectively (see example calculations below). The OW attachment you sent me has 222.3 (Tc-99) and 89.16 (Sr-90) pCi/L. Also, U-238 should be 153 pCi/L but the attachment had 213.9 pCi/L.

Cwater (Tc-99) = 10^{-5} / 15 pCi/L * 0.022 kg/day * 1 * 70 years * 365 d/yr * 4e-12 risk/pCi = **297 pCi/L** (vs DRAT 309 pCi/L)
Cwater (Sr-90) = 10^{-5} / 2.9 pCi/L * 0.022 kg/day * 1 * 70 years * 365 d/yr * 9.53e-11 risk/pCi = **64.4 pCi/L** (vs DRAT 43 pCi/L)

Note that the AWQC equivalents derived using the DRAT fish meals approach are only different because it uses CERCLA's 350 days/year in lieu of OW's 365 days/year. It took me a minute to figure out why they were different.

Glenn --- sorry for the redirection (and possible confusion), but please discard my email/table sent earlier today since they were based on the CERCLA EF and use the one attached to this email.

Shanna

From: Amoroso, Cathy <Amoroso.Cathy@epa.gov>
Sent: Friday, September 24, 2021 6:49 PM
To: Alexander, Shanna <Alexander.Shanna@epa.gov>
Subject: RE: request for your help

Here are the Office of Water calculations…

From: Alexander, Shanna <Alexander.Shanna@epa.gov>
Sent: Friday, September 24, 2021 6:28 PM
To: Amoroso, Cathy <Amoroso.Cathy@epa.gov>
Subject: RE: request for your help

Hi Cathy,

I checked the default CWA AWQC for the 4 rads you had provided me and was able to replicate the 0.19 pCi/L for Cs-137, but I can't seem to replicate the values you listed for Tc-99, U-238 and Sr-90. The table I sent earlier to the group has the corrected AWQC as calculated in my attached spreadsheet. My values are in red font below. Please tell me if I'm missing something here. The difference for Tc-99 may be due to rounding, but not for U-238 and Sr-90.

Tc 99: 297 pi/L (308)
U -238: 214 pi/L (159)

C-137: 0.19
Sr 90: 89 (43)

Thanks,
Shanna

From: Amoroso, Cathy <Amoroso.Cathy@epa.gov>
Sent: Monday, September 20, 2021 4:33 PM
To: Alexander, Shanna <Alexander.Shanna@epa.gov>; Richards, Jon M. <Richards.Jon@epa.gov>
Subject: RE: request for your help

Using CWA guidance defaults, the awqcs are:
Tc 99: 297 pi/L
U -238: 214 pi/L
C-137: 0.19
Sr 90: 89

From: Alexander, Shanna <Alexander.Shanna@epa.gov>
Sent: Monday, September 20, 2021 3:48 PM
To: Richards, Jon M. <Richards.Jon@epa.gov>; Amoroso, Cathy <Amoroso.Cathy@epa.gov>
Subject: RE: request for your help

Is it okay to send this over to Glenn now or Cathy, did you want to send to Glenn?

Shanna

From: Richards, Jon M. <Richards.Jon@epa.gov>
Sent: Monday, September 20, 2021 1:40 PM
To: Alexander, Shanna <Alexander.Shanna@epa.gov>; Amoroso, Cathy <Amoroso.Cathy@epa.gov>
Subject: RE: request for your help

Looks great from what we discussed.. and sorry if I confused things on the 25% column, but I think I agree to keep it simple
And shows we not necessarily agreeing they are not ~= 10-5 risk
Of course I'd still add at least suggest to add below the table the Cs137 MCL of 200 pCi/L just so its somewhere on the page for Blevins to see

Jon Richards
Regional Radiation Expert & RPM
US EPA R4, SEMD
Richards.jon@epa.gov
404-431-1340

From: Alexander, Shanna <Alexander.Shanna@epa.gov>
Sent: Monday, September 20, 2021 1:37 PM
To: Amoroso, Cathy <Amoroso.Cathy@epa.gov>
Cc: Richards, Jon M. <Richards.Jon@epa.gov>
Subject: RE: request for your help

Please take a look at the following and let me know if you want to adjust the variable descriptions or place of order.

Below is a summary table comparing the site-specific instream water column PRGs (which are equivalent to the Clean Water Act's Ambient Water Quality Criteria) and DOE's end of pipe rad discharge limits based on DOE's proposed low and high range of assimilative capacity (i.e., 3 and 16). Also included for comparison are the current rad discharge measurements for Bear Creek and DOE's 25% DCS values.

Radionuclide*	Units	Site-Specific Instream Ambient Water Quality Criteria Equivalent (assuming 15.08 fish meals and no assimilative mixing)	Example DOE End of Pipe Effluent Rad Discharge Limit (assuming assimilative capacity of 3)**	Example End of Pipe Effluent Rad Discharge Limit (assuming assimilative capacity of 16)**	Current Average Discharge Measurements	DOE 25% DCS Value
Cs-137	pCi/L	1.19	3.57	19.04	5.05	750
Sr-90	pCi/L	382	1,146	6,112	3.41	275
Tc-99	pCi/L	1,873	5,619	29,968	171	11,000
U-238	pCi/L	967	2,901	15,472	1.66	188

**These are example calculations only since actual radionuclide discharge limits will be a function of the implemented engineering controls (size of pipe, water flow rate at end of pipe, flow rate of receiving body, etc.).

Shanna Alexander, DABT | Toxicologist
Scientific Support Section | Resource & Scientific Integrity Branch
Superfund & Emergency Management Division
U.S. Environmental Protection Agency
61 Forsyth Street, Atlanta, Georgia 30303
☎ (404) 562-8635 | Email: Alexander.Shanna@epa.gov

From: Adams, Glenn <Adams.Glenn@epa.gov>
Sent: Monday, September 20, 2021 11:45 AM
To: Amoroso, Cathy <Amoroso.Cathy@epa.gov>; Richards, Jon M. <Richards.Jon@epa.gov>; Alexander, Shanna <Alexander.Shanna@epa.gov>
Cc: Frederick, Tim <Frederick.Tim@epa.gov>
Subject: request for your help

I met with the John, Carol, Ramon, and Randall this morning and have need of your help.

1) Can one of you send me a short summary table of the instream water quality numbers for about 4 of the rads including Cs? I want to compare the value from DOE, EPA default values (CWA numbers), and using our site specific CERCLA calculations (15 meals/year)?
2) John asked that we reach out to Stuart, and maybe include Joel, to talk about the assumptions that the DRAT has come up with and see if OSRTI agrees or disagrees with our process. We need to know if OSRTI staff are going to fight us on this issue or agree that the CERCLA risk assessment process will work in this case.

I can meet with you if needed to discuss but I have already talked to Cathy about this.
Thanks,

Glenn

H. Glenn Adams, Chief
Restoration & Site Evaluation Branch
Superfund & Emergency Management Division
404-562-8771 (o) 404-229-9508 (c)